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## Lessons from yesterday: A student's reflection on Scottish medical education

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### Abstract

The previous century has witnessed radical changes to the way in which medical students in Scotland are taught. Given the rapidly advancing medical landscape this is understandable, yet agreement on course content, how it should be taught and by whom, all remain contentious. However throughout the years the medical profession has endured, and skills have been passed down to successive generations; so are there any lessons to be learnt from our past? This paper suggests that there are, and seeks to illustrate the many parallels between 18<sup>th</sup> and 19<sup>th</sup> century teaching and today, including the quintessence of an inspirational teacher. A wide variety of 18<sup>th</sup>-21<sup>st</sup> century primary and secondary sources have been perused in the preparation of this paper.

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### 1. Introduction

The relentlessly fast-paced, ever-evolving nature of medicine poses a continual challenge for medical education to keep up. Indeed the past century in Scotland has observed a general shift away from basic science teaching, towards a more clinically orientated, systems-based approach centered around the student. However there is not complete consensus that this is the correct way to teach medicine. Moreover, given the investment of everyone from doctors to scientists, the public, state and students in the training of new doctors, this subject can invoke vociferous debate. Yet medicine has always relied upon the successful teaching of skills and knowledge to future practitioners, a responsibility which is denoted in the Hippocratic Oath. So how did we arrive here?

Although the experience of 18<sup>th</sup> and 19<sup>th</sup> century Scottish medical education may seem irrelevant, this article seeks to elucidate and explore the many similarities and lessons from inspirational pioneers that remain pertinent today.

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## 2. The birth of enlightened medical education

For Scotland the 18<sup>th</sup> century heralded the optimistic era of the Enlightenment, embodied by academic advancement and an overall utilitarian belief in societal betterment. This period challenged current thought, and bore witness to original research and scientific progression. It was this culture in which the Scottish system of medical education evolved and became eminent in Europe during this time.

However, at the beginning of the century medical teaching was inconsistent. Whilst surgeons were able to serve apprenticeships, and attend the occasional dissection of a convict's body, instruction for future physicians at Scottish universities was more variable (Hamilton, 1981). Courses could include Greek, Latin, theology, Hebrew, Syriac, mathematics, ethical philosophy, physics, dialectics and the logic of *Organon* (Aristotle). It was not until fourth year that students were exposed to physical science, involving medicine (Selkirk, n.d.). Consequently, it was quite usual for aspiring physicians to travel to the Continent to study medicine. Leiden, located in the Netherlands, was a particularly popular destination due to the reputation of Hermann Boerhaave for teaching applied medicine, rather than purely theoretical knowledge. It was this practical approach to medicine which returning medical men brought back to Scotland and modeled their teaching upon (Hamilton, 1981).

One such graduate was the surgeon John Monro, whose industrious efforts resulted in the establishment of the Faculty of Medicine within the University of Edinburgh in 1726 (Lawrence, 2006). His tenacity and belief in bedside teaching also led to the opening of the Royal Infirmary in 1741; although the linking of university and hospital teaching was not accepted across Scotland until later (Hamilton, 1981). Monro's influence is particularly notable, as at the time surgeons were viewed as mere craftsmen. This lesser distinction between physicians and surgeons in Scotland, and the early incorporation of both disciplines in medical education, perhaps fostered a more generalist approach to teaching and aided later success (Lawrence, 2006).

Indeed due to the absence of a prescribed curriculum, students were free to select their own subjects, thus were able to train in medicine, surgery and midwifery, creating valuably versatile graduates (Rosner, 1992). Lecturers were inclined to emphasize their own subjects, due to the dependence of their salary on student numbers (Hamilton, 1981). However there were many illustrious teachers at the time, notably William Cullen, whose logic and zeal for medicine inspired students. He rejected empiricism in favor of practical examination, original investigation and reasoning, accentuating that medicine could only be understood through a system (a science) (Comrie, 1927). This was a principle that constantly distinguished Scottish medical education and practice into the twentieth century.

Another novel feature of the Scottish course was the liberal attitude taken towards the admission of students. Scotland afforded the opportunity to learn medicine in spite of social class, faith, country of origin or training background, and so was attractive to many, with only a small enrolment and lecture fee (Lawrence, 2006). Poor Scottish students were often welcomed and allowed tuition free of cost (today higher education is funded for Scottish students) (Guthrie, 1967). It was this removal of barriers to learning, and a willingness to invest in ability and broadening knowledge that risked the tight social constitution of British medicine (Lawrence, 2006). Indeed this classless system was criticized in Oxford and London due to the three to five year course duration (contrasted with eight to twelve years), the youth of graduates (often teenagers) and their poor command of Latin and Greek, as lectures were in English. This was certainly not a suitable training for gentleman professionals (Hamilton, 1981).

In the latter half of the century 2,600 medical degrees were obtained from Scottish universities, more than ten times the figure from Cambridge or Oxford; a figure which does not even include those who did not qualify due to the extra cost of obtaining an MD following study (Bonner, 1995). Medical education in this era was much indebted to determined figures, such as Monro, that rejected the existing order and forged new teaching styles, with emphasis on bedside instruction and the use of case learning from practice rather than textbooks.

## 3. The place of medical education in the nineteenth century

Scotland's success in medical training continued into the start of the nineteenth century, supplying nearly 95% of Britain's university qualified practitioners. However, there were signs that the quality of education was diminishing and falling behind the Continent. The large student numbers made clinical teaching difficult to accommodate on the wards. There was also an over-reliance on lectures, and teaching began to stagnate as lecturers were unwilling to revise their subjects to incorporate new sciences, such as physiology. This was partially due to the dependence of

professors on the income from tickets of admission sold to students for lectures. In contrast, university-paid positions were becoming available on the Continent, which allowed the substantial teaching burden to be shared, and afforded the staff time to dedicate to research and medical advancement. Moreover, in Scotland student to staff ratios were 1:30 compared to 1:11 in German universities, who were rapidly distinguishing themselves in medical education and scientific progression. Additionally, unlike the Continent, Scotland did not receive state funding to support endeavours such as building hospitals or laboratories, and so struggled to keep pace (Hamilton, 1981).

In 1826 the Royal Commissioners for Visiting the Universities and Colleges of Scotland came to assess medical education, and in 1830 published recommendations such as a standard syllabus, regulating the free-market approach to education, reducing enrolment and implementing a classical studies admissions exam (Rosner, 1991). However legislation was not passed until 1858, when the General Council of Medical Education and Registration (General Medical Council, GMC) was also founded through the “The Medical Act”. The intention of this was to produce a record of competent practitioners and improve control over the numerous disorganised systems of medical training in the country (Loudon, 1995).

Although as the *Lancet* noted twenty years later, the GMC had failed to have much impact (Youngson, 1989). Complaints of poor comprehension and assimilation of medical knowledge in new doctors were ubiquitous, with condemnation of the unhelpful “*system of practical cram*” upon which students were conditioned. Emphasis seemed to be placed on the onerous perfunctory learning of textbook facts, neglecting the skills of keen observation and flexibility of thought previously espoused by Cullen and his contemporaries (*Lancet*, 1880).

Furthermore, debate abounded as to the prerequisites required to read medicine – a broad spectrum of knowledge, a Gentleman’s education in the classics, any education or a firm basis in science were all arguments (Youngson, 1989). Gradually it was decided that scientific instruction should be strengthened, given its increasing prominence in the profession. Yet the duration of the course was merely forty-five months, so this posed the problem of how to fit in this extra tuition. Moreover only 23% of students managed to qualify in this allotted time anyway, and those who did were often painfully aware of their inadequacy to start work, particularly due to the lack of practical medical skills taught, and so would delay this by gaining more hospital experience or further education (*Lancet*, 1885).

Sir John Struthers, a member of the GMC (1883-1891) and Regius Professor of Anatomy at Aberdeen University (1863-1889), recognized these deficiencies and it was under his influence and insights that many important reforms took place, including the extension of the course to five years, with the final year devoted to clinical work (*BMJ*, 1889). He was highly critical of the lecture-intensive Scottish curriculum and sympathized with students, advising them not to fret if they were unable to remember all that was imparted, as the “*value lies in the general idea*” (Struthers, 1856). Instead of lectures he advocated more practical small group teaching where the students could gain knowledge through their own observations and reasoning, rather than simply being told. He also believed that better integration of the foundation sciences and clinical knowledge was required to avoid repetition and make lectures more applicable. Furthermore, he promoted the concept that students should receive “*true clinical instruction at the bedside*”, whilst keeping student numbers to a minimum to ensure the quality of teaching (Struthers, 1869). He also appreciated the significance of a good teacher to guide students, and implored a diligent work ethic (Struthers, 1896). His concepts are comparable to today’s GMC teaching guidelines (Waterson, 2007).

Similar values to those of Struthers were also being expounded in America, which had been greatly influenced by the Edinburgh Medical School. The revered physician, humanist and enthusiastic educator, Sir William Osler, was a great proponent of bedside teaching, and was known for inspiring students with his “*ward walks*” (*BMJ*, 1920). He was also one of the “*big four*” who established the pioneering Johns Hopkins Medical School that revolutionised teaching by incorporating scientific principles with clinical work, taking students out of the lecture theatre and placing them in clinics, wards and laboratories (Johns Hopkins Medicine, n.d.). Indeed the notable Flexner report into medical education held this model in great esteem, stating that the student was no longer passive in his education, rather “*he does*” (Flexner, 1910). The teaching philosophy of Osler was thus,

*“The whole art of medicine is in observation ... but to educate the eye to see, the ear to hear and the finger to feel takes time, and to make a beginning, to start a man on the right path, is all that we can do.”*

He also believed that the demand on students was too high and that they were often over-taught (Cushing, 1925). This sentiment was also shared by another renowned medical educator, Professor Oliver Wendell Holmes of Harvard Medical School. However, he contended that it was harder for students to learn solely practical facts, that

information was more memorable in a system, whereby knowledge is integrated, as with the linking of structure and function. Thus facts that may be unpractical in the future, were still of value in learning the practical facts, yet it was crucial to keep this to a minimum (Bergey, 1977).

#### 4. Conclusion

Despite the periodical idiosyncrasies and advances in medical knowledge, many of the discussions and dilemmas of yesterday are still recognizable today, and the insights of pioneers pertinent. Medical teaching now often involves clinical contact from day one, with universities supplementing hospital ward teaching through simulated scenarios with volunteer “patients” in well-equipped clinical skills centers. There is also increasing integration of science with clinical teaching, with emphasis on fewer lectures and further small group teaching, in line with the GMC guidelines for “*Tomorrow’s Doctors*” (GMC, 2003).

Consistently though, medical education has been driven forward by the tenacity and vision of certain individuals. Moreover, the role of the teacher in shaping the practice of students has long been discussed, with Osler likening the absence of such individual spirit to that of an Arctic winter. Indeed he thought it was the enthusiasm and aspirations of educators that distinguished a university (regardless of means) and inspired students, and he encouraged a close relationship between the pupil and teacher, rather than cold separation (Osler, 1905). Today the GMC speaks of role models, and with the increase in clinical exposure in the new curriculum this is perhaps even more relevant (GMC, 2003). However, just as presently the stay of patients in hospitals is more transient, so too is the continuity of ward teachers. No longer do clinicians have their own group of familiar medical students, and nor are students an extension of the medical team (P.S., personal communication, 16 November 2011). Struthers recognized that students must be involved on the wards as a “*dresser or clerk*” (Struthers, 1856). Yet this is not necessarily a slight upon clinicians and those who organize clinical opportunities, but perhaps a symptom of training at large, whereby increased student numbers, a loss of professional autonomy, governmental pressures, business ethos and consumer principles conspire to create a more detached system (P.S., personal communication, 16 November 2011).

Regardless of changes we have not yet perfected medical education, with dissenting opinions remaining on student selection and numbers, teaching methods and course content. Indeed Sir William Gull, a member of the GMC in the 1880s, bemoaned that it was likely the council would go on disputing the same points for all of eternity (Youngson, 1989). Although hyperbolic, it captures the essence of medical reformation; and certainly this active dialogue abides by the key lessons that we must continuously observe, contemplate, re-evaluate and evolve to changing circumstances. We may not always get it right, but throughout the years there have always been inspirational figures to share their inquisitive spirit, humanity and passion for medicine with young practitioners, and as Osler said, “No bubble is so iridescent or floats longer than that blown by the successful teacher.” (Osler, 1911)

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